

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of:

Carrier Current Systems, including Broadband over Power Line Systems)	
)	ET Docket No. 03-104
)	
Amendment of Part 15 regarding new requirements and measurement guidelines for Access Broadband over Power Line Systems)	ET Docket No. 04-37
)	

To: The Commission

REPLY COMMENTS OF WILLIAM A. TYNAN

I hereby respectfully submit a reply to those comments filed in response to the
above *Notice of Proposed Rule Making* (the Notice). .

1. I filed comments in response to the Notice, as well as comments and reply
comments in response to the *Notice of Inquiry*, ET Docket No. 03-104. .
2. I have reviewed many of the comments filed with the Commission in response to
the Notice and find several which include the results of tests conducted on actual
operating Access BPL systems. These tests clearly show that the emissions from
those sites are strong enough to cause severe and harmful interference to amateur
stations, as well as others using the HF spectrum under conditions similar to those
encountered by amateurs. Furthermore, this interference is not limited to specific
times and spot frequencies, but is pervasive 24/7 throughout the amateur bands
and presumably the entire HF spectrum. I submit that, if Access BPL causes
serious harmful interference to licensed amateurs, it will also cause similar

interference to other HF spectrum users, many of which employ the HF spectrum for vital communications. Thus, the Commission should not merely consider the affects Access BPL might have on licensed amateurs, it must also carefully evaluate the potential damage deployment of the technology can wrought on these other services. In support of this concern, I cite particularly the comments submitted by: Boeing, Aeronautical Radio Incorporated (ARINC), the Association of Maximum Service Television (MSTV), the Society of Amateur Radio Astronomers (SARA) and Ship Com, LLC. Even FEMA, now a part of the Department of Homeland Security, expresses concern for the potential for Access BPL interference to its HF communications facilities. Other entities such as the Association of Public Safety Communications Officials-International (APCO) and the Missouri State Highway Patrol, plead for the, “not in our backyard”, approach.

3. In support of PROOF that Access BPL systems WILL cause interference, I point, especially, to comments filed by Carl R. Stevenson (Stevenson) and ARRL. Stevenson, a recognized authority in this field, provided specific test results, not conjecture, which is more than can be said for the submissions of the various Access BPL proponents. The results obtained by Stevenson and ARRL clearly confirm the interference concerns of thousands of amateurs and others who have pointed out the pitfalls of adopting this flawed technology. In contrast, those promoting Access BPL provide NO test data whatsoever - merely assurances that any interference will be taken care of. It’s as if they’re trying to sell the Commission some well-traveled bridge. Their claims are particularly

unsupported in light of the horrible record, power companies have in dealing with noise from their lines. I have read that there have been a number of instances in recent years in which the Commission has been called upon to take action in such cases. Imagine what it will be faced with when thousands of complaints from amateurs and others, begin pouring in every week as a result of Access BPL interference.

4. The additional workload the Commission will face is only a part of the expense associated with Access BPL operation, expense which will be borne by other than those deriving income from its operation. I call the Commission's attention to a very fine treatise on this subject provided by Mr. Robert B. Famiglio of Media, Pennsylvania in his comments. How much will amateurs and other spectrum users have to expend in order to attempt to overcome the effects of Access BPL interference? How much expenditure will the Commission be subjected to? The answers to both questions are difficult to assess, but they're bound to represent considerable expenditures – expenditures which Access BPL purveyors will escape altogether. One example of such “transfer of financial responsibility” might be the number of amateurs and other HF spectrum users that might have to increase power in attempts to overcome Access BPL interference.
5. In its comments, Verizon states in part, “Because power cables used for BPL are unshielded and unbalanced, these cables may ‘leak’ or emit part of the high frequency energy in the form of electromagnetic radiation (or ‘radiated emissions’)...”. Verizon also notes that, “BPL may potentially interfere with

existing voice or DSL service. They also question its compatibility with next generation DSL technology, what they term VDSL.

6. Despite this evidence to the contrary, some filing comments in favor of Access BPL deployment, such as Progress Energy (Progress), claim that "the interference potential of Access BPL is marginal." Progress admits that it has "received, what it terms, "several complaints of alleged 'harmful interference' from amateur radio operators (hams)". However, it dismisses such complaints, with the statement, "those who have submitted complaints about Progress Energy's BPL system intentionally seek out interference using very sophisticated and sensitive equipment." My contention is that such a statement is absolutely ridiculous, and shows how little Progress, and presumably other Access BPL proponents, know about Amateur Radio, indeed any kind of modern radio. It is organizations such as this that the Commission plans to turn loose on the radio spectrum? Progress 's statement displays their utter lack of knowledge regarding testing of radio and electronic devices. Anyone who knows anything about the subject should be aware that measurements should always be made using the best available equipment. Anything else yields invalid results. Invalid results seem to be what Progress wishes to obtain; whatever results it can obtain to support its contention that Access BPL does not cause interference. Well, it DOES cause interference and that fact has been PROVEN. I cannot believe that the Commission, the historic guardian of the radio spectrum, can proceed with a technology which has been PROVEN to be detrimental to HF communications, based ONLY on CLAIMS that little or no "harmful" interference will result; especially when these

CLAIMS come from proponents who don't back up their statements with any sort of data. Trust us, they tell the Commission.

7. Clear admission that Access BPL DOES cause interference is provided by Ambient Corporation (Ambient), a manufacturer of Access BPL systems. Ambient claims that "under the Commission's policies, 'a certain amount of interference between devices is acceptable; however, beyond a certain limit interference can be considered harmful.'" Ambient goes on to request that "the Commission set the boundaries for what is considered harmful interference so there is a realistic opportunity for the early deployment of BPL technologies...". Ambient is, in essence, telling the Commission to define away the problem, so that Access BPL can go ahead and operate despite producing massive harmful interference. In any event, I note that "harmful interference" is already defined in the ITU Radio Regulations as "interference which endangers the functioning of a radionavigation service or seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service operating in accordance with these Radio Regulations." This definition is repeated at various places in the Commission's Rules. Not only is another definition unnecessary, but the Radio Regulations themselves prohibit the Commission from adopting or applying any definition of harmful interference not consistent with this international treaty language, a treaty to which the United States is a signatory. What matters under this definition is not the strength, or power flux density of the interfering signal, but the effect it has on reception of the intelligence.

8. I also call the Commission's attention to ARRL's legal analysis, presented in this Proceeding. It demonstrates that licensed services such as Amateur Radio are entitled under the Communications Act and, in the case of international communication, the Radio Regulations, to absolute protection from harmful interference caused by Part 15 devices. Since the commission states that Access BPL systems are to be under Part 15, they must accept any interference they might receive from licensed stations operating in accordance with FCC Rules and the International Table of Frequency Allocations. Thus, the Commission has no statutory authority to create exceptions that require licensed stations to "tolerate a certain amount of harmful interference" from Part 15 devices, or to take measures to accommodate such interference as they might produce. In fact, I would assert that it (the Commission) will be derelict in its duty if it creates such exception in order to accommodate Access BPL, or any other system operating under Part 15.
9. I submit that the adaptive features of Access BPL technology, cited by Progress as a way of mitigating interference, offer NO meaningful protection to amateur radio. Many amateurs spend a lot of their time, listening - transmitting only infrequently. Obviously, a BPL system has no way of knowing the frequency to which an amateur is listening. Therefore, such poorly- thought-out measures would be completely ineffective. The only feasible way of providing such protection, short of prohibiting Access BPL altogether as some foreign countries have found it necessary to do, is to require Access BPL systems to notch out all amateur bands, and to adopt adequate technical standards for doing so. This would also benefit the Access BPL industry as it would eliminate most

occurrences of reports of interference TO Access BPL system FROM amateur stations. It would also relieve the Commission's burden with respect to dealing with numerous interference complaints both from and to Access BPL systems. PowerWAN, Inc. (PowerWAN), another manufacturer of Access BPL systems, notes that its technology already notches out the amateur bands. However, I remind the Commission that, as noted above, several non-amateur organizations commenting; have urged that Access BPL not be allowed to use their particular portions of the spectrum. Even FEMA, now part of the Department of Homeland Security, have expressed qualms. NTIA has as well. FEMA has written Chairman Powell stating, "We have become aware that certain distinct approaches to BPL may have the potential to cause interference to FEMA's high frequency radio emergency communications system." If amateur bands, and all of these other services which have registered concerns regarding Access BPL interference, are notched out; Access BPL's spectrum will look something like a Swiss cheese. One wonders if it can function with so many holes punched in it. Can the Commission ignore all of these users of the radio frequency spectrum, which provide vital services to the Nation, and simply plunge ahead with Access BPL anyway? I note with interest that, though the FEMA letter raises concern over Access BPL interference, it goes on to support it; expressing the hope that the technology will be made available to the public without compromising emergency communication. I believe that their concern is real, and they make that clear. Nevertheless, they go to support Access BPL. My contention is that, they MUST support it, as the President has strongly endorsed it. What else can

any Government agency do but support the President, at least publicly?

Nevertheless, the warnings regarding the damage this stop-gap attempt to bring broadband to the American people can do to many kinds of radio communications are myriad and convincing. I question whether or not President Bush has been informed of interference potential of Access BPL. It is difficult for me to believe that, if he was, he would have voiced his support for its deployment. If he was NOT so informed, the blame for the damage to the Country's communications must be placed on whoever was entrusted with providing our Chief Executive will ALL of the salient facts.

10. Access BPL is almost certain to have impact beyond the frequencies it actually utilizes. This is true because of two phenomena implicit in radio. One of these is the generation of energy at frequencies which are both even and odd multiples of the frequencies intentionally generated (harmonics). Another is mixing products. These are generated by combinations of two or more RF carriers being present in a nonlinear medium. This mixing process is used to advantage in all present day radio receivers and most modern transmitters. It's called heterodyning where one signal is mixed with another to produce sum and difference frequencies. Usually, in a receiver, it is the difference frequency that is desired; the sum being filtered out. This difference frequency is then amplified and detected. In the case of a transmitter, it is usually the sum, which is desired. But, this useful phenomenon can be a nuisance when two or more signals meet in a nonlinear medium such as a corroded joint in a power line. In the case of Access BPL, this can cause the various carriers involved to produce many

spurious frequencies, which are sums and differences of each other. Thus, these spurious signals can be both above and below the range of frequencies used by the Access BPL system. The ones above, along with the harmonics, will appear at VHF and higher frequencies. Moreover, being higher in frequency (shorter in wavelength) they will radiate more readily from the power lines carrying them, than will the fundamental frequencies actually being used by the Access BPL system. This is NOT speculation. Both harmonic generation and signal mixing are fundamental to radio and have been known since the earliest days of the art. I am amazed that none of the Access BPL proponents, nor the Commission, have addressed this well known fact of radio life. It was pointed out in my initial comments as well as those by AMSAT, the Roadrunners Microwave Group, the Central States VHF Society and several others. They noted, that merely notching out amateur frequencies, will not be sufficient, to handle the problem of interference created by out-of-band signals produced by harmonics and/or mixing. Thus, because of these out-of-band signals, Access BPL operation can cause interference to VHF amateur assignments including amateur satellite downlinks and weak signal work such as long-haul terrestrial and moonbounce. Also affected may be other non-amateur communications at VHF and UHF frequencies i.e. various emergency services such as police and, fire, as well as safety-of-life aircraft communications. I urge that much further technical investigation be devoted to this issue before any authorization of Access BPL is forthcoming.

11. I note that the National Telecommunications and Information Administration (NTIA) submitted comments dated June 4, which include a lengthy technical

appendix. I have not yet had sufficient time to review this document and, therefore reserve the right to submit additional, late-filed comment in response to the NTIA presentation. I trust that the Commission will consider any such comments I might submit.

12. The Central Station Alarm Association (CSAA), brings up an interesting observation regarding interference NOT associated with radiation from the power lines carrying Access BPL signals. CSAA points to the fact that many radio receivers are connected to power lines in order to obtain power, and that Access BPL signals can find their way into such receivers via the power cord. I submit that this is another piece of evidence that power lines are for supplying power, not conducting radio frequency signals. I am sure the Access BPL proponents will say that installation of filters can easily solve this problem. This is perhaps true but it is another example of transfer of expenditures, that is unless the Access BPL operators are willing to shell out money for perhaps millions of filters.

For the reasons stated, strongly urge the Commission to give a great deal more thought to this matter before proceeding with authorization of Access BPL. Further, I hope that President Bush will be briefed on ALL salient facts both pro and con, so that he can make an informed decision as to whether or not he wishes to continue to support the fielding of Access BPL technology.

RESPECTFULLY SUBMITTED,

William A. Tynan June 22, 2004

1054 Indian Creek Loop

Kerrville, TX 78028-1763 E-mail: btynan@omniglobal.net